UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,466	02/05/2002	Hiroki Shoki	218965US2SRD	2839

22850 7590 05/20/2004

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
LE, DUY K	

ART UNIT	PAPER NUMBER
2685	6

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/062,466	SHOKI, HIROKI	
	Examiner	Art Unit	
	Duy K Le	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3, 5.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 4, 12, and 15-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Endo et al. (EP 1003239 A2).

As to claim 1, Figure 6 in Endo shows a vehicle antenna apparatus capable of corresponding to a plurality of radio communication systems ("FIG. 6 is a block diagram illustrating a basic constitution of the above advanced antenna apparatus. The antenna unit 6 includes a control circuit section 60 having a multifunction as shown in the upper part of FIG. 6, and the center console 7 has a reception set section 70 as shown in the lower part thereof' (Col. 7, lines 6-11)), comprising:

a plurality of antennas (611, 621, 631, 641, 642) provided correspondingly to the radio communication systems ("a control circuit section (60) provided close to the smart antenna (3) and connected to at least part of the smart antenna (3); and an antenna unit (6) which is electronically controlled by the control circuit section (60) to make the smart antenna (3) integrated and intelligent so as to fulfill a receiving function of receiving an AM broadcast wave,

an FM broadcast wave, a TV broadcast wave, and a GPS wave and a transmitting/receiving function of transmitting/receiving waves for a car phone and keyless door-lock control, broadcast waves relayed by a broadcast satellite and a communications satellite, and a wave for using an automatic toll collection system" (Col. 13, lines 30-44));

a plurality of processing circuits (612, 622, 710, 730) whose one ends (input ports or output ports) are connected to the antennas to apply processings including amplification and frequency conversion to signals input from the one ends of the antennas received from a corresponding antenna or signals to be transmitted to a corresponding antenna input to the other ends of the antennas ("amplifiers 612 and 622" and "tuners 710 and 730) in Col. 7, lines 12-38. "FIG. 7 is a block diagram illustrating the internal structure of the AM/FM tuner 710. Since the TV tuner 730 has basically the same structure as that of the AM/FM tuner 710, its description is omitted" (Col. 7, line 57 to Col. 8, line 2). "The amplified signal is supplied to a detector 718 through another band-pass filter 717 and detected and demodulated as an FM intermediate frequency signal. This signal is output to the control circuit 614 as a feedback signal S2 on one hand, and it is output to a high-speed data bus interface 65 as a reception signal S3 on the other hand" (Col. 8, lines 13-19));

at least one external connector (66) configured to output reception signals to an external unit or inputs transmission signals sent from the external unit ("the antenna unit 6 is connected to a car-mounted computer network containing a center console 7 through a LAN (local area network) using an optical fiber 5 as a signal transmission line" (Col. 6, line 57 to Col. 7, line 3). "In FIG. 6, reference numerals 65 and 75 each indicate a high-speed data bus interface, 66 and 76 each denote a photoelectric converter" (Col. 7, lines 51-53)); and

a unit (65) connected between the other ends of the processing circuits and the external connector to couple reception signals output from the processing circuits or distribute transmission signals input from the external connector to the processing circuits ("the antenna unit 6 is connected to a car-mounted computer network containing a center console 7 through a LAN (local area network) using an optical fiber 5 as a signal transmission line" (Col. 6, line 57 to Col. 7, line 3). "In FIG. 6, reference numerals 65 and 75 each indicate a high-speed data bus interface, 66 and 76 each denote a photoelectric converter" (Col. 7, lines 51-53)).

As to claim 2, Figure 6 in Endo shows a vehicle antenna apparatus capable of corresponding to a plurality of radio communication systems ("FIG. 6 is a block diagram illustrating a basic constitution of the above advanced antenna apparatus. The antenna unit 6 includes a control circuit section 60 having a multifunction as shown in the upper part of FIG. 6, and the center console 7 has a reception set section 70 as shown in the lower part thereof" (Col. 7, lines 6-11)), comprising:

a plurality of receiving antennas (611, 621, 631, 641, 642) provided correspondingly to the radio communication systems to receive radio waves transmitted from an external unit and to output reception signals ("a control circuit section (60) provided close to the smart antenna (3) and connected to at least part of the smart antenna (3); and an antenna unit (6) which is electronically controlled by the control circuit section (60) to make the smart antenna (3) integrated and intelligent so as to fulfill a receiving function of receiving an AM broadcast wave, an FM broadcast wave, a TV broadcast wave, and a GPS wave and a transmitting/receiving function of transmitting/receiving waves for a car phone and keyless door-lock control, broadcast

waves relayed by a broadcast satellite and a communications satellite, and a wave for using an automatic toll collection system" (Col. 13, lines 30-44));

a plurality of receiving frequency converters (710, 730) configured to frequency-convert reception signals sent from the receiving antennas ("FIG. 7 is a block diagram illustrating the internal structure of the AM/FM tuner 710. Since the TV tuner 730 has basically the same structure as that of the AM/FM tuner 710, its description is omitted" (Col. 7, line 57 to Col. 8, line 2). "The amplified signal is supplied to a detector 718 through another band-pass filter 717 and detected and demodulated as an FM intermediate frequency signal. This signal is output to the control circuit 614 as a feedback signal S2 on one hand, and it is output to a high-speed data bus interface 65 as a reception signal S3 on the other hand" (Col. 8, lines 13-19));

a coupler (65) configured to couple signals output from the receiving frequency converters and to output one output signal ("the antenna unit 6 is connected to a car-mounted computer network containing a center console 7 through a LAN (local area network) using an optical fiber 5 as a signal transmission line" (Col. 6, line 57 to Col. 7, line 3). "In FIG. 6, reference numerals 65 and 75 each indicate a high-speed data bus interface, 66 and 76 each denote a photoelectric converter" (Col. 7, lines 51-53)); and

at least one external connector (66) connected with an external unit to transfer signals output from the coupler to the external unit ("the antenna unit 6 is connected to a car-mounted computer network containing a center console 7 through a LAN (local area network) using an optical fiber 5 as a signal transmission line" (Col. 6, line 57 to Col. 7, line 3). "In FIG. 6, reference numerals 65 and 75 each indicate a high-speed data bus interface, 66 and 76 each denote a photoelectric converter" (Col. 7, lines 51-53)).

As to claim 4, the Endo reference discloses the vehicle antenna apparatus according to claim 2, wherein the plurality of receiving frequency converters convert signals received from the plurality of receiving antennas into proximate frequencies ("FIG. 7 is a block diagram illustrating the internal structure of the AM/FM tuner 710. Since the TV tuner 730 has basically the same structure as that of the AM/FM tuner 710, its description is omitted" (Col. 7, line 57 to Col. 8, line 2). "The amplified signal is supplied to a detector 718 through another band-pass filter 717 and detected and demodulated as an FM intermediate frequency signal. This signal is output to the control circuit 614 as a feedback signal S2 on one hand, and it is output to a high-speed data bus interface 65 as a reception signal S3 on the other hand" (Col. 8, lines 13-19)).

As to claim 12, Figure 6 in Endo shows the vehicle antenna apparatus according to claim 2, further comprising an E/O converter (66) configured to convert a signal output from the coupler into an optical signal and supplies the optical signal to the external connector ("the antenna unit 6 is connected to a car-mounted computer network containing a center console 7 through a LAN (local area network) using an optical fiber 5 as a signal transmission line" (Col. 6, line 57 to Col. 7, line 3). "In FIG. 6, reference numerals 65 and 75 each indicate a high-speed data bus interface, 66 and 76 each denote a photoelectric converter" (Col. 7, lines 51-53)).

As to claim 15, the Endo reference discloses the vehicle antenna apparatus according to claim 1, wherein at least one of the antennas is an array antenna and a beam-forming network for forming an optional antenna beam through the array antenna is included ("an EHF array antenna 110" in Col. 11, lines 3-30. See also Figures 16A and 16B).

As to claim 16, the Endo reference discloses the vehicle antenna apparatus according to claim 15, further comprising a CPU which controls the beam-forming network ("control circuit section 60" in Col. 11, lines 23-30 and Col. 14, lines 15-35).

As to claim 17, the Endo reference discloses the vehicle antenna apparatus according to claim 1, wherein at least one of the antennas is an array antenna, and a beam-forming network which forms an optional antenna beam through the array antenna and a CPU which controls the beam-forming network and the processing circuits are included (see Col. 11, lines 3-30 and Col. 14, lines 15-35).

As to claim 18, the Endo reference discloses the vehicle antenna apparatus according to claim 16, further comprising a memory storing the information for the above control by the CPU (see Col. 14, lines 15-35).

As to claim 19, the Endo reference discloses the vehicle antenna apparatus according to claim 1, wherein the antennas are provided on the same first substrate (see Figure 3 and Col. 6, lines 3-10).

As to claim 20, the Endo reference discloses the vehicle antenna apparatus according to claim 1, wherein the antennas are provided on the same first substrate and the processing circuits and a unit which performs the above coupling or distribute are provided on the first substrate or a second substrate different from the first substrate (see Figures 2, 3, and 4 and Col. 5, line 31 to Col. 6, line 24).

3. Claims 3, 6, 8, 11, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Jonasson (U.S. Patent 6,396,447).

As to claim 3, Figures 2 and 3 in Jonasson show a vehicle antenna apparatus capable of corresponding to a plurality of radio communication systems, comprising:

a plurality of receiving antennas (12, 17) provided correspondingly to the radio communication systems to receive radio waves transmitted from an external unit and to output reception signals (see Col. 4, lines 27-36 and lines 57-62);

a plurality of receiving frequency converters (20) configured to frequency-convert signals received from the antennas (see Col. 5, lines 19-34);

a coupler (22) configured to couple signals output from the receiving frequency converters and to output one output signal ("a coordinator or coordinating means 22, for example a multiplexor 22, is arranged on the printed circuit board 14 to multiplex a plurality of input signals into an output signal" (Col. 5, lines 5-7));

at least one external connector (23) connected with an external unit to transfer signals output from the coupler to the external unit ("a communication interface 23, which operates as an interface with a vehicle's internal communication path, preferably takes the form of a databus running around the vehicle in a loop 25 which may consist of e.g., a conductive metal cable or an optical cable" (Col. 5, lines 8-12));

at least one transmitting frequency converter (20) configured to frequency-convert transmission signals input to the external connector from an external unit ("the antenna unit may also comprise transmitters, which in the same way as the receivers, are arranged on the printed circuit board and at least one antenna" (Col. 6, lines 12-15)); and

at least one transmitting antenna provided correspondingly to at least one radio communication system to receive signals output from the transmitting frequency converter and to

radiate radio waves ("the antenna unit may also comprise transmitters, which in the same way as the receivers, are arranged on the printed circuit board and at least one antenna" (Col. 6, lines 12-15)).

As to claim 6, the Jonasson reference discloses the vehicle antenna apparatus according to claim 3, wherein the external connector includes an output terminal and an input terminal, transfers signals output from the coupler to the external unit through the output terminal, and inputs signals transmitted from the external unit to the input terminal ("the output signals 33 are connected to the multiplexor 22 where they are multiplexed to a common signal 34. This signal is received by the communication interface 23 which communicates with the databus 25" (Col. 5, lines 39-42). "The antenna unit may also comprise transmitters, which in the same way as the receivers, are arranged on the printed circuit board and at least one antenna" (Col. 6, lines 12-15)).

As to claim 8, the Jonasson reference discloses the vehicle antenna apparatus according to claim 3, wherein at least one of the receiving antennas and at least one of the transmitting antennas are used in common ("the antenna unit may also comprise transmitters, which in the same way as the receivers, are arranged on the printed circuit board and at least one antenna" (Col. 6, lines 12-15)).

As to claim 11, the Jonasson reference discloses the vehicle antenna apparatus according to claim 3, further comprising a D/A converter configured to convert a transmission signal input from the external connector as a digital signal into an analog signal and supplies the analog signal to the transmitting frequency converters ("each tuner unit 20 is connected to at least one of the antennae 12, 17" (Col. 5, lines 19-20). "Either the tuner 27 within the tuner 20 works

digitally (for example, a GSM tuner), or, in the case of an analog tuner 27 such as a radio tuner, the output signal from the analog tuner 27 is converted from analog to digital so that the output signal 33 from each tuner unit 20 is digital. Therefore, in addition to the tuner 27, each tuner unit 20 may comprise an analog-to-digital converter as appropriate" (Col. 5, lines 27-34). "The antenna unit may also comprise transmitters, which in the same way as the receivers, are arranged on the printed circuit board and at least one antenna" (Col. 6, lines 12-15). It is inherent that the transmitters have D/A converters to convert a transmission signal input from digital to analog, just as the receivers receive analog signals and convert them to digital before these signals are multiplexed and communicated to a databus).

As to claim 14, the Jonasson reference discloses the vehicle antenna apparatus according to claim 3, further comprising an O/E converter which converts a transmission signal input from the external connector as an optical signal into an electrical signal and supplies the electrical signal to the transmitting frequency converters ("a communication interface 23, which operates as an interface with a vehicle's internal communication path, preferably takes the form of a databus running around the vehicle in a loop 25 which may consist of e.g., a conductive metal cable or an optical cable" (Col. 5, lines 8-12). "The antenna unit may also comprise transmitters, which in the same way as the receivers, are arranged on the printed circuit board and at least one antenna" (Col. 6, lines 12-15)).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,396,447 to Jonasson in view of Emura (U.S. Patent 5,424,864).

As to claim 5, the Jonasson reference discloses the vehicle communication system according to claim 3, wherein the external connector includes one input/output terminal. However, it does not expressly disclose a separation element inserted between the input/output terminal, the output end of the coupler, and the input ends of the transmitting frequency converters to separate transmission signals from reception signals. The Emura reference teaches a separation element inserted between the input/output terminal, the output end of the coupler, and the input ends of the transmitting frequency converters to separate transmission signals from reception signals ("transmission/reception branching filter 106 for transmitting signals to and receiving signals from antenna 110" (Col. 4, lines 51-53). See also Figure 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Jonasson wherein the external connector includes a separation element inserted between the input/output terminal, the output end of the coupler, and the input ends of the transmitting frequency converters to separate transmission signals from reception signals, as taught by Emura, in order to transmit signals to and receive signals from an antenna or external unit.

As to claim 7, the Jonasson reference discloses the vehicle antenna apparatus according to claim 3, further comprising a distributor configured to distribute transmission signals input to the external connector from said external unit to the transmitting frequency converters. The

Emura reference teaches a distributor configured to distribute transmission signals input to the external connector from said external unit to the transmitting frequency converters ("the output optical signals from electrical-to-optical transducers 221 to 224 are then combined by the optical coupler into an optical signal which is then amplified by optical amplifier 41. The amplified optical signal is then transmitted through downstream optical fiber transmission line 11, and branched to the radio base stations 2 to 5 by the optical coupler. The transmitted optical signals include all the signals destined for the four microcells. In each of radio base stations 2 to 5, the transmitted optical signals are converted back into electrical signals by optical-to-electrical converter 101. The electrical signals are amplified by micro-wave-band amplifier 102, and then frequency-converted by frequency converter 103" (Col. 5, lines 27-41)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Jonasson to further comprise a distributor configured to distribute transmission signals input to the external connector from said external unit to the transmitting frequency converters, as taught by Emura, in order to include all signals destined for transmission.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1003239 A2 to Endo et al. in view of Kudoh et al. (U.S. Patent 6,034,641).

As to claim 9, the Endo reference discloses the vehicle antenna apparatus according to claim 2. However, it does not disclose an A/D converter configured to convert signals output from the coupler into digital signals and supplies the digital signals to the external connector. The Kudoh reference teaches an A/D converter configured to convert signals output from the

coupler into digital signals and supplies the digital signals to the external connector ("A/D converter circuit 52" in Col. 5, lines 40-53 and Figure 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Endo to further comprise an A/D converter configured to convert signals output from the coupler into digital signals and supplies the digital signals to the external connector, as taught by Kudoh, in order to convert a signal output into a digital signal.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1003239 A2 to Endo et al. in view of Jonasson (U.S. Patent 6,396,447).

As to claim 10, the Endo reference discloses the vehicle antenna apparatus according to claim 2. However, it does not disclose a plurality of A/D converters configured to convert signals output from the receiving frequency converters into digital signals and supply the digital signals to the coupler, wherein the coupler couples digital signals output from the A/D converters through parallel-serial conversion and synthesizes them into one signal. The Jonasson reference teaches a plurality of A/D converters configured to convert signals output from the receiving frequency converters into digital signals and supply the digital signals to the coupler, wherein the coupler couples digital signals output from the A/D converters through parallel-serial conversion and synthesizes them into one signal ("each tuner unit 20 is connected to at least one of the antennae 12, 17" (Col. 5, lines 19-20). "Either the tuner 27 within the tuner 20 works digitally (for example, a GSM tuner), or, in the case of an analog tuner 27 such as a radio tuner, the output signal from the analog tuner 27 is converted from analog to digital so that the output signal 33 from each tuner unit 20 is digital. Therefore, in addition to the tuner 27, each tuner unit 20 may

comprise an analog-to-digital converter as appropriate" (Col. 5, lines 27-34). "The output signals 33 are connected to the multiplexor 22 where they are multiplexed to a common signal 34" (Col. 5, lines 39-40). The multiplexor 22 functionally couples the signals 33 and does the parallel-serial conversion).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Endo to further comprise a plurality of A/D converters configured to convert signals output from the receiving frequency converters into digital signals and supply the digital signals to the coupler, wherein the coupler couples digital signals output from the A/D converters through parallel-serial conversion and synthesizes them into one signal, as taught by Jonasson, in order to multiplex a plurality of input signals into an output signal.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1003239 A2 to Endo et al. in view of Emura (U.S. Patent 5,424,864).

As to claim 13, the Endo reference discloses the vehicle antenna apparatus according to claim 2. However, it does not disclose a plurality of E/O converters which convert signals output from the receiving frequency converters into optical signals and supply them to the coupler, wherein the coupler couples optical signals output from the E/O converters and synthesizes them into one optical signal. The Emura reference teaches a plurality of E/O converters which convert signals output from the receiving frequency converters into optical signals and supply them to the coupler, wherein the coupler couples optical signals output from the E/O converters and synthesizes them into one optical signal ("the frequency-converted signals are then converted to optical signals by electrical-to-optical transducers 221 to 224. The output optical signals from

electrical-to-optical transducers 221 to 224 are then combined by the optical coupler into an optical signal which is then amplified by optical amplifier 41. The amplified optical signal is then transmitted through downstream optical fiber transmission line 11, and branched to the radio base stations 2 to 5 by the optical coupler" (Col. 5, lines 22-34)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Endo to further comprise a plurality of E/O converters which convert signals output from the receiving frequency converters into optical signals and supply them to the coupler, wherein the coupler couples optical signals output from the E/O converters and synthesizes them into one optical signal, as taught by Emura, in order to include all signals into one optical signal.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Kaminski et al. (U.S. Patent 6,574,459) discloses multiple branch receiver system and method.

b. Sakurai (U.S. Patent 4,531,232) discloses radio receiver apparatus for vehicle.

c. Taniguchi et al. (U.S. Patent 5,056,153) discloses mobile electric accessory apparatus.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Duy Le
May 13, 2004

EDWARD F. URBAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600